

REMARKS

Office action summary. Claims 1-6, 8, 9, 12, 13, 17-24, and 45 are rejected as indefinite on account of the expressions “tertiary nitrogen atoms” and “tetracyclic.” Claims 1-6, 8, 9, 12, 13, 17-24, 45, 46, and 47 are rejected for failure to meet the written description requirement.

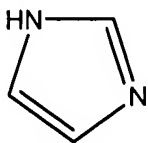
These rejections are traversed.

The applicants thank the Examiner for his rejoinder of claims 18-24 and his indication that claims 43, 44, and 48-52 would allowable if written in independent form.

Amendments to the specification. Paragraph [00062] is amended to give the correct structure for brucine (see *Merck Index*, 13th edition, item 1440).

Claim amendments. Claim 47 is amended to correct a typographical error in the previous amendment.

Indefiniteness rejections. (A) The term “tertiary nitrogen atom” is in common use in chemistry. This is shown by the Google search and patent database search attached as Exhibit A to this response. A tertiary nitrogen atom is a nitrogen atom not bonded to a hydrogen. This is shown, for example, by the usage of the term in the Zhang paper also attached in Exhibit A. That paper refers to the tertiary nitrogen atoms of imidazole (p. 867, bottom line). Imidazole is a molecule which in its neutral form has one nitrogen atom with a hydrogen attached and another (the tertiary nitrogen atom) which does not have a hydrogen atom attached:



imidazole

(B) The term “tetracyclic” is in common use in chemistry to mean having four rings. Tetracyclic is commonly applied, for example, to terpenes and to certain antidepressants in order to distinguish them from related compounds having a different number of rings. This is shown for example by the printouts attached as Exhibit B, which show that the search “tetracyclic terpenes” finds 131 occurrences in the PubMed database and that the search “tetracyclic antidepressant” finds 223 hits. “Tetracyclic” is also used to describe steroids, as in the book excerpt also included in Exhibit B.

Written description rejections. The standard for written description is whether the specification shows that the inventors were in possession at the time of filing of the invention as claimed. *See, e.g., Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64 (Fed. Cir. 1991).

(A) The term “tertiary nitrogen atom” finds adequate support in the term which it replaces, “tertiary amine.” That term denotes a class of compounds having tertiary nitrogen atoms.

Applicants used “tertiary nitrogen atom” in place of “tertiary amine” in claim 1 for at least one specific reason. In claim 1 applicants wished to express the concept of how many linking atoms there were between the two tertiary nitrogen atoms. This concept could not unambiguously be expressed by referring to the number of linking atoms between the tertiary amines, because the term “amine” could refer to a moiety encompassing more than just the nitrogen atom. For this reason, applicants introduced the more precise concept of a tertiary nitrogen atom.

The term “tertiary nitrogen atom” is also supported by a number of examples in the specification of chiral ligands containing such atoms. In paragraph [00062] a number of chiral ligands with tertiary nitrogen atoms are shown. Much of the data given in the Examples of the application pertains to these ligands.

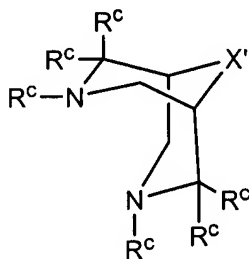
(B) The Examiner also finds that the term “tetracyclic” in claim 45 lacks written description. “Tetracyclic” has the same meaning as “four-ring,” as explained above, and is thus supported by the latter term, which is found in paragraphs [00038] and [00040] of the application and in originally-filed claims 32 and 38. “Tetracyclic” is also supported by the fact that the preferred chiral ligand sparteine (structure given below) is tetracyclic.

(C) Finally, the Examiner finds that the modification of claim 46, which allows the R^c's not directly bonded to N to be hydrogen, is not supported by the specification.

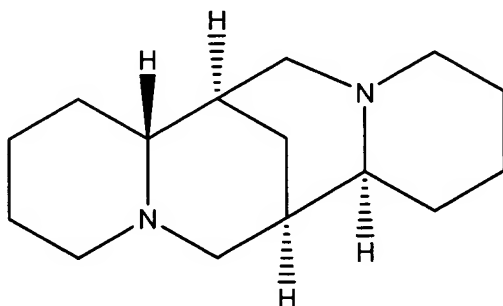
To begin with, allowing those R^c's to be hydrogen is supported by the broad disclosure of chiral ligands with two tertiary amine functions as in claim 1 and original claim 25. The formula of claim 46 simply describes a particular class of chiral ligands with two tertiary amine functions, within the broad disclosure of the application. Having a tertiary amine function does not exclude the possibility that carbons on the ligand, adjacent to the amine, are bonded to hydrogen. That broad disclosure of chiral ligands with tertiary amine functions in general thus

suggests that the inventors were in possession of an invention in which the R^c's not attached to N in the formula of claim 46 could be hydrogen.

Furthermore, the formula of claim 46 is the same as that given in paragraph [00039] of the application:



In the specification at paragraph [00040] it is stated that a preferred chiral ligand obtained from the formula in paragraph [00039] is (-)-sparteine. Sparteine has the following structure (*Merck Index*, 13th edition, entry 8810):



As may be seen from this structure, sparteine has at least one H on every carbon atom directly bonded to the nitrogens. Thus, sparteine will only fall within the formula of paragraph [00039] if R^c's not directly bonded to N are allowed to be hydrogen. For this reason, a person of skill in the art, seeing the formula of paragraph [00039] and seeing the statement in paragraph [00040] that sparteine falls within the scope of that formula, would conclude that the inventors had possession of an invention in which the R^c's not connected directly to N in the formula of paragraph [00039] could be hydrogen.

In addition, in original claim 37, the formula of claim 46 was given. In original claim 39, the chiral ligand of claim 37 was stated to be (-)-sparteine. Claim 39, being dependent on claim 37, must have a scope included in that of claim 37. This would further convince a person of skill

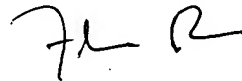
in the art that the inventors had possession of an invention in which the R^c's not connected directly to N in the formula of claim 46 could be hydrogen.

The proviso that R^c's substituted directly to N cannot be hydrogen finds support in claim 1, on which claim 46 depends. That claim requires two tertiary nitrogen atoms. The nitrogen atoms in the formula of claim 46 would not be tertiary if one of the substituents attached to them were hydrogen.

Conclusion. It is believed that the amendments and arguments above overcome the Examiner's rejections. If the Examiner has any questions about these issues, it is respectfully requested that he contact the applicants' attorney at the telephone number given below.

Respectfully submitted,

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